

CLAIMS

1. A reciprocating piston machine comprising at least one working membrane (1)
5 and/or at least one auxiliary membrane made from an elastomeric material and having an oscillating drive, engaging the membrane (1) in a central area (3), with a deformable membrane area (M) being provided between the central area (3) of the membrane (1) and a circumferential edge area (5) clamped in the reciprocating piston machine and deforming during the oscillating pumping movement,
10 characterized in that a different geometrical adjustment of the working membrane and/or the auxiliary membrane (1), caused by the drive, to mounting points provided in the central area and at the circumferential edge area is developed by two merging curves, which define a shape of the membrane.
- 15 2. A reciprocating piston machine according to the preamble of claim 1, particularly according to claim 1, characterized in that a membrane cross-section of the working membrane and/or auxiliary membrane is sized in the deformable membrane area (M), such that during pumping movement almost identical tension and/or elastic deformations develop in an upper surface membrane zone of the
20 deformable membrane area (M).
3. A reciprocating piston machine according to the preamble of claim 1, particularly according to claims 1 or 2, characterized in that the working membrane and/or auxiliary membrane has at least two cantilever-shaped annular areas (7, 8) in the
25 deformable membrane area (M), merging in a cross-sectional reduction (9) of the membrane (1), and that the cross-section of the membrane, starting from the cross-sectional reduction, enlarges in each of the annular areas (7, 8).
4. A reciprocating piston machine according to one of claims 1 through 3,
30 characterized in that the cross-section of the membrane at least partially enlarges linearly in the annular areas (7, 8).

5. A reciprocating piston machine according to one of claims 1 through 4,
characterized in that the cross-sectional reduction (9) ranges from 0.6 to 0.8 in
reference to a diameter of the deformable membrane area (M).
- 5 6. A reciprocating piston machine according to one of claims 1 through 5,
characterized in that the reciprocating piston machine is embodied as a membrane
pump.
- 10 7. A reciprocating piston machine according to one of claims 1 through 6,
characterized in that the working membrane of the membrane pump is embodied
as a molded membrane or a flat membrane.
- 15 8. A working membrane or auxiliary membrane for a reciprocating piston machine,
which is designed according to one of claims 1 through 7.